

REMARKS/ARGUMENTS

Claims 1-33 are pending herein. Claims 18 and 19 have been amended as supported by paragraph [0049] of the present application, for example. Claims 28, 31 and 32 have been amended as supported by paragraph [0051] of the present application, for example. Claims 1-17 stand withdrawn.

1. Claims 18-20, 24 and 28-32 were rejected under the judicially created doctrine of obviousness-type double patenting over claims 1, 4 and 9 of U.S. Patent No. 6,918,530. This rejection is respectfully traversed.

First, the Examiner is respectfully requested to note that this rejection is nearly identical to a rejection issued in the Office Action mailed December 9, 2005. At the time of that Office Action, only claims 24 and 31-33 were pending as a result of a Restriction Requirement mailed September 27, 2005. Accordingly, the rejection in the Office Action of December 9, 2005 included only claims 24 and 31-33. Importantly, the rejection of claims 23 and 31-33 under the judicially created doctrine of obviousness-type double patenting over the '530 patent were withdrawn as a result of arguments presented in an Amendment filed March 9, 2006. Further, during a brief telephonic interview with Examiner Kerns on November 8, 2007, Examiner Kerns indicated that he did not realize that the rejection of claims 24 and 31-33 was made and subsequently withdrawn. In light of the foregoing, the Examiner is respectfully requested to note that the arguments presented below are similar to those presented in the Amendment filed March 9, 2006 and found to be acceptable by the Examiner in charge of the case at that time.

Independent claims 18 and 19 have been amended to recite a method that includes a step of disposing a barrier layer, which comprises a material which has a higher melting point than the solder and which protects against or suppresses the diffusion of a metal constituting the metallic member into the solder material. This limitation distinguishes the pending claims from the claims of the '530 patent, as there is no disclosure or suggestion in the claims of the '530 patent of this feature.

Independent claim 24 recites a method that includes a step of disposing a barrier layer, which comprises a material which has a higher melting point than the solder and which protects against or suppresses the diffusion of a metal component constituting the metallic member into the solder material as an inner layer. This limitation distinguishes the pending claims from the claims of the '530 patent, as there is no disclosure or suggestion in the claims of the '530 patent of this feature.

Independent claims 28 and 29 recite a method for producing a different materials bonded member comprising at least the step of disposing a metallic member comprising one of Cr and an alloy composed essentially of Cr on a surface of the precoat layer. The step of disposing the metallic member "on a surface of the precoat layer" distinguishes the pending claims from the claims of the '530 patent, as there is no disclosure or suggestion in the claims of the '530 patent of this feature.

Amended independent claims 31 and 32 recite a method for producing a different materials bonded member comprising at least the step of disposing in turn on a bonded surface of the ceramic base (i) a metalized layer comprising a metal which is active to a ceramic constituting a ceramic base, (ii) the solder material, and (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr. The step of disposing a metallic member comprising one of Cr and an alloy composed essentially of Cr directly onto a solder material distinguishes the pending claims from the claims of the '530 patent, as there is no disclosure or suggestion in the claims of the '530 patent of this feature.

For at least the foregoing reasons, Applicants respectfully submit that independent claims 18, 19, 24, 28, 29, 31 and 32 are allowable over the '530 patent. Since claim 20 depends directly from claim 19, and claim 30 depends directly from claim 29, those claims are also believed to be allowable over the '530 patent. Accordingly, reconsideration and withdrawal of the present rejection are respectfully requested.

2. Claims 18-33 were rejected under §102(b) over Shinkai '813. To the extent that this rejection can be applied against the amended claims, it is respectfully traversed.

The Examiner is respectfully requested to note that each of independent claims 18, 19, 24, 28, 29, 31 and 32 include significant differences from one another. However, for the sake of clarity to the point being made, the discussion below relating to these claims will combine the claims to the extent possible.

Claims 18, 19, 24, 28, 29, 31 and 32 each recite a method for producing a different materials bonded member comprising a ceramic base and a metallic member bonded to one another via a solder material comprising Au.

A. Claim 18 recites that the method comprises the steps of, in relevant part, disposing the solder material on a bonded surface of the ceramic base including one of an active metal layer comprising a metal which is active to the ceramic constituting the ceramic base, and heating and melting the solder material to form a precoat layer adhering to the bonding surface of the ceramic base. The method further comprises the step of disposing the metallic member on a surface of the precoat layer, with a barrier layer interposed between the metallic member and the ceramic base, the barrier layer comprising a material which has a higher melting point than the solder and which protects against or suppresses the diffusion of a metal constituting the metallic member into the solder material.

B. Claim 19 recites that the method comprises the steps of, in relevant part, disposing the solder material on a bonding surface of the ceramic base, the solder material comprising a metal which is active to a ceramic comprising the ceramic base, and heating and melting the solder material to form a precoat layer adhering to the bonding surface of the ceramic base. The method further comprises the steps of disposing the metallic member on a surface of the precoat layer, with a barrier layer interposed between the metallic member and the ceramic base, the barrier layer comprising a material which has a higher melting

point than the solder and which protects against or suppresses the fusion of a metal comprising the metallic member into the solder material.

C. Claim 24 recites that the method comprises the steps of, in relevant part, disposing in turn on a bonding surface of the ceramic base (i) one of an active metal layer and a metalized layer comprising a metal which is active to a ceramic constituting a ceramic base, (ii) the solder material, (iii) a barrier layer comprising a material which has a higher melting point than the solder and which protects against or suppresses the diffusion of a metal component constituting a metallic member into the solder material as an inner layer, and (iv) the metallic member.

D. Claim 28 recites that the method comprises the steps of, in relevant part, forming a metalized layer on a bonding surface of the ceramic base by the use of one of a paste and vapor phase process, the metalized layer comprising a metal which is active to a ceramic constituting the ceramic base. The method further comprises the step of disposing the solder material on the metalized layer.

E. Claim 29 recites that the method comprises the steps of, in relevant part, disposing the solder material on a bonding surface of the ceramic base, the solder material comprising a metal which is active to a ceramic constituting the ceramic base.

F. Claim 31 recites that the method comprises the steps of, in relevant part, disposing in turn on a bonding surface of the ceramic base (i) a metalized layer comprising a metal which is active to a ceramic constituting the ceramic base, (ii) the solder material, (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr. The metalized layer is disposed on the bonding surface by use of one of a paste and a vapor process.

G. Claim 32 recites that the method comprises the steps of, in relevant part, disposing in turn on a bonding surface of the ceramic base (i) a metalized layer comprising a metal which is active to a ceramic constituting a

ceramic base, (ii) the solder material comprising a metal which is active to the ceramic constituting the ceramic base, and (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr. The metallized layer is disposed on the bonding surface by use of one of a paste and a vapor process.

Shinkai '813 fails to disclose or suggest a barrier layer. Shinkai '813 discloses, in Fig. 1(b), and paragraph [0040], that the active metal foil 4 and the Au solder 5 are joined to create a bonding layer 6. Shinkai '813 further discloses, in Fig. 1(b) that the bonding layer 6 is used to join a metallic member 7 to a ceramic base 1. Shinkai '813 discloses, in paragraph [0057], that the metallic member is made of a material from the group including Cr, or an alloy having, as a main constituent, the element Cr. Shinkai '813 does not disclose or suggest the inclusion of a barrier layer between the bonding layer 6 and the metallic member 7. Therefore, Shinkai '813 fails to disclose or suggest a method comprising the step of disposing the metallic member on a surface of the precoat layer, with the barrier layer interposed between the metallic member and the ceramic base, as recited in claims 18 and 19. Similarly, Shinkai '813 fails to disclose or suggest the method comprising the step of disposing intern on a (i) bonding surface of the ceramic base, (ii) the solder material, (iii) a barrier layer, and (iv) a metallic member, as recited in claim 24.

Shinkai '813 also fails to disclose or suggest disposing the solder material comprising a metal which is active to a ceramic constituting a ceramic base onto a bonding surface of the ceramic base. Shinkai '813 clearly discloses, in Fig. 1(b) and paragraph [0040], that the active metal foil 4 and the Au solder 5 are joined to create a bonding layer 6. Shinkai '813 does not disclose or suggest that the solder 5 can or should contain a metal which is active to the ceramic base. Further, because Shinkai '813 discloses that the solder 5 is to be placed directly onto the active metal foil 4, the solder 5 is not disposed directly onto the bonding surface of the ceramic base. Therefore, Shinkai '813 fails to disclose or suggest a method comprising the step of disposing a solder material on a bonding surface of the ceramic base, the solder

material comprising a metal which is active to a ceramic constituting the ceramic base, as recited in claims 19 and 29.

Shinkai '813 fails to disclose or suggest a metalizing layer. As discussed in further detail above, Shinkai '813 clearly discloses, in Fig. 1(b) and paragraph [0040], that an active metal foil 4 and an Au solder 5 are to be placed in turn on a ceramic base 1. There is no disclosure or suggestion within Shinkai '813 of a metalizing layer. Further, Shinkai '813 fails to disclose or suggest that such a layer can or should be applied to the surface of the ceramic base by use of one of a paste and a vapor process. Therefore, Shinkai '813 fails to disclose or suggest the method comprising the step of forming a metalized layer on a bonding surface of the ceramic base by the use of one of a paste and a vapor phase process, the metalized layer comprising a metal which is active to a ceramic constituting the ceramic base, as recited in claim 28. Further, Shinkai '813 fails to disclose or suggest a method comprising the step of disposing intern on a bonding surface of the ceramic base (i) a metalized layer comprising a metal which is active to a ceramic constituting a ceramic base by use of one of a paste and a vapor process, as recited in claims 31 and 32.

For at least the foregoing reasons, Applicants respectfully submit that Shinkai '813 fails to disclose or suggest at least one step in each of independent claims 18, 19, 24, 28, 29, 31 and 32. Since claim 20 depends directly from claim 19, claims 21-23 and 25-27 depend directly from claim 18, claim 30 depends directly from claim 29, and claim 33 depends directly from claim 32, those claims are also believed to be allowable over the applied prior art. Accordingly, reconsideration and withdrawal of the present rejection are respectfully requested.

3. Claims 18-33 were rejected under §102(e) over Shinkai '530. To the extent that this rejection may be applied against the amended claims, it is respectfully traversed.

Shinkai '530 discloses, in Figs. 2a-c, the placement of an insertion layer 10 between the precoat layer 6 (made up of an active metal layer 4 and a solder material 5) and a metallic member 7. Shinkai '530 discloses, in column 15, lines 10-17, that

the insertion layer comprises “pure metal which may form an alloy (low-melting-point Au alloy) having a lower melting point than Au with Au or an alloy (low-melting-point Au alloy) of the pure metal and Au. Furthermore, Shinkai ‘530 discloses, in column 15, lines 52-65, that the “base material and the metallic member can be bonded together only by keeping the insertion metal layer and the precoat layer at the same temperature.” Clearly, the insertion layer 10 of Shinkai ‘530 is not in any way similar in form or function to the barrier layer of the present invention having a higher melting point than the solder containing Au. Therefore, Shinkai ‘530 fails to disclose the inclusion of a barrier layer comprising a material which has a higher melting point than the solder and which protects against or suppresses the diffusion of a metal component of the metallic member into the solder material, as recited in independent claims 18, 19 and 24.

As discussed above, Shinkai ‘530 discloses the inclusion of an insertion metal layer 10 between the precoat layer 6 (made of the active metal layer 4 and the solder material 5) and the metallic member 7. Shinkai ‘530 discloses, in column 8, lines 56-59, that the insertion metal layer 10 must be formed densely so that the precoat layer 6 and the metallic member 7 substantially do not make contact with each other. Shinkai ‘530 discloses, in column 15, lines 52-65, that the “base material and the metallic member can be bonded together only by keeping the insertion metal layer and the precoat layer at the same temperature.” Accordingly, Shinkai ‘530 does not disclose or suggest placing the metallic member 10 directly onto the precoat layer 6 containing the active metal layer 4 and the solder material 5. Therefore, Shinkai ‘530 fails to disclose or suggest the method comprising the step of disposing a metallic member comprising one of Cr and an alloy composed essentially of Cr on a surface of the precoat layer, as recited in claims 28 and 29. Further, Shinkai ‘530 fails to disclose or suggest the method comprising the step of disposing intern on (i) a bonding surface of the ceramic base, (ii) the solder material, and (iii) the metallic member comprising one of Cr and an alloy composed essentially of Cr, as recited in claims 31 and 32.


For at least the foregoing reasons, Shinkai '530 fails to disclose or suggest at least one step in each of independent claims 18, 19, 24, 28, 29, 31 and 32. Since claim 20 depends directly from claim 19, claims 21-23 and 25-27 depend directly from claim 18, claim 30 depends directly from claim 29, and claim 33 depends directly from claim 32, those claims are also believed to be allowable over the applied prior art. Accordingly, reconsideration and withdrawal of the present rejection are respectfully requested.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

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